Clues to the Importance of "The Subjective" in Human Healthspan and Longevity

Srini Pillay on A New Path for Understanding What it Means to Be Alive

Introduction

There is an intangible essence to being alive that often goes unnoticed. The fragrance of love and the quiet imprint of deep friendship shape us in lasting ways, yet they evade measurement and therefore remain largely invisible. Ironically, although these moments are among the most enduring and meaningful of our lives, they rarely appear in the models we use to understand healthspan and longevity.

Medical science relies heavily on the power of scrutiny. And if something cannot be perceived or measured, it will live forever outside of any medical model of healthspan and longevity. In fact, the business of science relies so heavily on perception and measurement, that if something is real, yet cannot be perceived or measured, it is often relegated to the hell where illusions, delusions, lies, and madness live.

In this essay, I want to make the case for releasing "the subjective" from the dungeons of obscurity into the new light of a medical model that honors the subjective and looks beyond measurement to carve a new path for understanding what it means to be alive. Paradoxically, because what I am speaking of is so ephemeral, I will rely on "clues" to urge you to consider that the wisps of human experience that fill the gaps between our objective sensibilities matter as much as those sensibilities themselves.

The Default Mode Network: Abstraction, the Self, and Healthspan

The default mode network participates in constructing, integrating, and maintaining subjective meaning over time, especially in narratives involving self, others, goals, and intentions.[1] Consistent with its role in abstract meaning, the DMN supports

[1] Yeshurun, Y.; Nguyen, M.; Hasson, U. The Default Mode Network: Where the Idiosyncratic Self Meets the Shared Social World. *Nat. Rev. Neurosci.* **2021**, *22* (3), 181–192. https://doi.org/10.1038/s41583-020-00420-w.

self-related and self-reflective processes that contribute to a coherent sense of narrative identity.[2]

It is also important to note that the DMN appears to be central to aging, many diseases and infirmity. Aging is associated with altered brain connectivity within the DMN.[3] Altered connectivity in key hubs within the DMN is also associated with systemic inflammation.[4] And poorer connectivity within the DMN is associated with poorer outcomes in cardiopulmonary arrest,[5] stroke,[6] and Alzheimer's disease.[7] Instability in DMN connections have also been found in major depression,[8] bipolar disorder,[9] anxiety disorders and post-traumatic stress disorder,[10] and attention deficit hyperactivity disorder.[11]

Given the DMN's role in abstraction and a "sense of self," as well as its involvement in multiple disease processes, I hypothesize that disturbances in abstraction and a sense of self may contribute to healthspan and longevity. The Paris Psychosomatic School supports this view.

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[2] Davey, C. G.; Harrison, B. J. The Brain's Center of Gravity: How the Default Mode Network Helps Us to Understand the Self. *World Psychiatry* **2018**, *17* (3), 278–279. https://doi.org/10.1002/wps.20553.

[3] Chow, R.; Rabi, R.; Paracha, S.; Hasher, L.; Anderson, N. D.; Alain, C. Default Mode Network and Neural Phase Synchronization in Healthy Aging: A Resting State EEG Study. *Neuroscience* **2022**, *485*, 116–128. https://doi.org/10.1016/j.neuroscience.2022.01.008.

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[6] Tuladhar, A. M.; Snaphaan, L.; Shumskaya, E.; Rijpkema, M.; Fernandez, G.; Norris, D. G.; de Leeuw, F.-E. Default Mode Network Connectivity in Stroke Patients. *PLoS ONE* **2013**, *8* (6), e66556. https://doi.org/10.1371/journal.pone.0066556.

[7] Mevel, K.; Chételat, G.; Eustache, F.; Desgranges, B. The Default Mode Network in Healthy Aging and Alzheimer's Disease. *Int. J. Alzheimers Dis.* **2011**, *2011*, 535816. https://doi.org/10.4061/2011/535816.

[8] Wise, T.; Marwood, L.; Perkins, A. M.; Herane-Vives, A.; Joules, R.; Lythgoe, D. J.; Luh, W.-M.; Williams, S. C. R.; Young, A. H.; Cleare, A. J.; Arnone, D. Instability of Default Mode Network Connectivity in Major Depression: A Two-Sample Confirmation Study. *Transl. Psychiatry* **2017**, *7* (4), e1105. https://doi.org/10.1038/tp.2017.40.

[9] Zovetti, N.; Rossetti, M. G.; Perlini, C.; Maggioni, E.; Bontempi, P.; Bellani, M.; Brambilla, P. Default Mode Network Activity in Bipolar Disorder. *Epidemiol. Psychiatr. Sci.* **2020**, *29*, e166. https://doi.org/10.1017/S2045796020000803.

[10] Yuan, M.; Liu, B.; Yang, B.; Dang, W.; Xie, H.; Lui, S.; Qiu, C.; Zhu, H.; Zhang, W. Dysfunction of Default Mode Network Characterizes Generalized Anxiety Disorder Relative to Social Anxiety Disorder and Post-Traumatic Stress Disorder. *J. Affect. Disord.* **2023**, *334*, 35–42. https://doi.org/10.1016/j.jad.2023.04.099.

[11] Norman, L. J.; Sudre, G.; Price, J.; Shastri, G. G.; Shaw, P. Evidence from "Big Data" for the Default-Mode Hypothesis of ADHD: A Mega-Analysis of Multiple Large Samples. *Neuropsychopharmacology* **2023**, *48* (2), 281–289. https://doi.org/10.1038/s41386-022-01408-z.

Abstraction, Fantasy, and Health: Insights from the Paris Psychosomatic School

Pierre Marty and his colleagues at the Paris Psychosomatic School emphasized the importance of living in ways that were not exclusively operationalized—that is, not confined to action, concrete thinking, and immediate adaptation to external demands.[12] They described a way of thinking called *pensée opératoire*, in which people focus only on facts and actions, with little emotion, imagination, or symbolism, and words are treated as if they were the same as the things they describe.[13] In this mode, experience is handled through action rather than reflection, and language loses its metaphorical richness, coming to "cover exactly the thing or the action," abolishing symbolic depth. As a result, emotional experience is insufficiently mentalized, leaving individuals more vulnerable to somatic expression of distress rather than psychological elaboration.

For example, in a psychosomatic study of women with breast lumps, psychological organization assessed before diagnosis was strongly associated with cancer outcomes.[14] All confirmed cancers occurred in women with *poorly organized* mental structures—characterized by limited emotional awareness, difficulty processing feelings symbolically, unresolved psychological stress, and a tendency for distress to be expressed through the body—while none occurred in those with well-organized inner experience. This finding reinforces the idea that subjective psychological organization may play a meaningful role in healthspan and longevity and should be integrated into models of aging and disease.

Later contributors extended this framework by highlighting the consequences of diminished fantasy and abstraction for bodily health. André Green famously observed that in psychosomatic states "the body takes part in the conversation," stepping in where symbolic thought and fantasy fail to mediate experience.

From this perspective, fantasy is not a luxury but a stabilizing psychic function that binds affect, sustains tension, and protects the body from direct inscription of

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[12] Oliner, M. M. An Essay on Bion's Beta Function. *Psychoanal. Rev.* **2013**, *100* (1), 167–183. https://doi.org/10.1521/prev.2013.100.1.167.

[13] Taylor, G. J.; Bagby, R. M.; Porcelli, P. Revisiting the Concept of *Pensée Opératoire* : Some Conceptual, Empirical, and Clinical Considerations. *Psychodyn. Psychiatry* **2023**, *51* (3), 287–310. https://doi.org/10.1521/pdps.2023.51.3.287.

[14] Jasmin, C.; Lê, M. G.; Marty, P.; Herzberg, R. Original Article: Evidence for a Link between Certain Psychological Factors and the Risk of Breast Cancer in a Case-Control Study. *Ann. Oncol.* **1990**, *1* (1), 22–29. https://doi.org/10.1093/oxfordjournals.annonc.a057666.

unprocessed stress. Bion's distinction between beta elements—raw, unmentalized sensory experiences—and their transformation through alpha function further underscores the importance of abstraction: when experience cannot be symbolized, it is either evacuated into action or expressed somatically. Together, these views converge on a shared insight: the capacity for abstraction, fantasy, and symbolic thought plays a critical protective role in maintaining psychosomatic integrity.

Viewed in this light, contemporary trends in health that increasingly prioritize operational metrics—such as step counts, heart rate variability, calcium scores, sleep indices, and even nutritional variables like daily protein targets—raise an important concern. While valuable, such measures risk reinforcing an operationalized conception of health that privileges quantification over symbolic, subjective, and experiential dimensions of being alive.

From a psychosomatic perspective, this drift toward exclusively operational definitions of health mirrors the very mode of functioning—*pensée opératoire*—that the Paris Psychosomatic School associated with increased vulnerability to somatic expression rather than resilience.

Qualia-An Ignored Aspect of Healthspan?

Qualia refer to the *phenomenal qualities of conscious experience* — the felt, first-person aspects of what it is like *to be* someone in an experience, such as the redness of red, the taste of wine, or the sting of pain. Qualia are distinguished from purely objective, operational variables precisely because they capture the subjective texture of experience that cannot be fully described by third-person measurements alone.

Qualia resist reductive physical explanations —no matter how complete our knowledge of neural mechanisms might be, it still seems to leave out what those experiences *feel like* from the inside. This "what it is like" aspect of consciousness underscores an ignored dimension of health: the felt quality of being alive, embodied, and engaged with the world — an internal sensory-affective experience that doesn't reduce to steps taken, calories consumed, or biomarker thresholds.

Attending to qualia thus highlights that health is not just a set of measurable biological states but also the rich, subjective experience of living itself, pointing toward the need for health models that integrate both objective and experiential dimensions of wellbeing.

While some researchers attribute qualia to the electromagnetic field generated by the movement and changes of electrical charges in the brain,[15] others think something different is happening: the brain takes in information from the senses, processes it, and then *loops that information back on itself*.[16] When the brain becomes aware of its own sensory processing, a conscious experience arises. What we actually feel is shaped not only by incoming signals but also by attention, expectations, memories, and context. More recently, some researchers have used *quantum-like* mathematical models to describe qualia, in which experience can change when it is observed or attended to, and in which outcomes are probabilistic, context-dependent, and not fully defined until measured.[17]

In this sense, a measurement is a static snapshot of a living process (for example, heart rate variability at a given moment). While valuable, such snapshots can miss the ongoing dynamics, adaptability, and individual variation that characterize living systems. Differences in how sensory and internal states are experienced highlight that subjectivity is a core feature of life—and one that should be considered in approaches to healthspan and longevity.

Purpose-In-Life (PIL), Healthspan and Longevity

PIL has been associated with better cognitive aging,[18] enhanced longevity,[19] and healthy aging in general, boosting resilience, mitigating age-related decline, and fostering well-being.[20] From a biological perspective, PIL helps regulate stress-related systems, lowering disease vulnerability and supporting longevity. Psychologically, it strengthens resilience, self-regulation, and emotional balance, protecting mental health and cognitive function. Socially, a strong sense of purpose deepens meaningful connections, encourages prosocial behavior, and reduces

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[15] Ward, L. M.; Guevara, R. Qualia and Phenomenal Consciousness Arise From the Information Structure of an Electromagnetic Field in the Brain. *Front. Hum. Neurosci.* **2022**, *16*, 874241. https://doi.org/10.3389/fnhum.2022.874241.

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[17] Tsuchiya, N.; Bruza, P.; Yamada, M.; Saigo, H.; Pothos, E. M. Quantum-like Qualia Hypothesis: From Quantum Cognition to Quantum Perception. *Front. Psychol.* **2025**, *15*. https://doi.org/10.3389/fpsyg.2024.1406459.

[18] Sutin, A. R.; Luchetti, M.; Terracciano, A. The Benefits of a Sense of Purpose in Life for Healthier Cognitive Aging: Commentary on Sense of Purpose as a Potential Buffer between Mental Health and Subjective Cognitive Decline. *Int. Psychogeriatr.* **2022**, *34* (12), 1015–1017. https://doi.org/10.1017/S1041610222000837.

[19] Hill, P. L.; Turiano, N. A. Purpose in Life as a Predictor of Mortality across Adulthood. *Psychol. Sci.* **2014**, *25* (7), 1482–1486. https://doi.org/10.1177/0956797614531799.

[20] Zábó, V.; Lehoczki, A.; Fekete, M.; Szappanos, Á.; Varga, P.; Moizs, M.; Giovannetti, G.; Loscalzo, Y.; Giannini, M.; Polidori, M. C.; Busse, B.; Kellermayer, M.; Ádány, R.; Purebl, G.; Ungvari, Z. The Role of Purpose in Life in Healthy Aging: Implications for the Semmelweis Study and the Semmelweis-EUniWell Workplace Health Promotion Model Program. *GeroScience* **2025**, *47* (3), 2817–2833. https://doi.org/10.1007/s11357-025-01625-6.

isolation, reinforcing social cohesion. Together, these interconnected pathways create a reinforcing system that supports healthier aging across the lifespan.

Individuals with higher PIL have been shown to have lower system segregation of the DMN, indicating greater integration with other brain circuits. Specifically, individuals with high PIL had greater inter-network connectivity between specific DMN nodes, including the frontal cortex, the hippocampal formation, the midcingulate region, and the rest of the brain.[21]

While PIL can be operationalized to enable measurement, the feeling of purpose is a more subjective state. Aristotle articulated this when he wrote that a sense of purpose is not about chasing a specific external goal, but about living in a way that aligns our rational lives with our highest virtues. In this view, happiness (eudaimonia) is not a reward we earn at the end, but the highest good itself—something that emerges when we consistently use reason well over the course of life. Health, wealth, and achievement matter not as ends in themselves, but because they support this deeper form of well-being. Because this kind of flourishing is inherently subjective and tied to how we live, choose, and make meaning, it is deeply relevant to healthspan and longevity—yet it is largely ignored by biological aging clocks that measure time in the body but not purpose in the person.[22]

Self-Transcendence, Healthspan and Longevity

According to Reed's nursing theory of self-transcendence, self-transcendence involves perspectives and behaviors that expand a person's sense of self beyond immediate boundaries.[23] This expansion can occur inwardly, through reflection on one's beliefs, values, and aspirations beyond the habitual self we usually present to the world; outwardly, through deeper connections with others and the natural environment; upwardly, through engagement with experiences or meanings that extend beyond the ordinary or observable; and temporally, by integrating past and future perspectives into present experience.

Various aspects of self-transcendence have been associated with healthspan and longevity. For example, social relationships have been associated with healthspan

[21] Abellaneda-Pérez, K.; Cattaneo, G.; Cabello-Toscano, M.; Solana-Sánchez, J.; Mulet-Pons, L.; Vaqué-Alcázar, L.; Perellón-Alfonso, R.; Solé-Padullés, C.; Bargalló, N.; Tormos, J. M.; Pascual-Leone, A.; Bartrés-Faz, D. Purpose in Life Promotes Resilience to Age-Related Brain Burden in Middle-Aged Adults. *Alzheimers Res. Ther.* **2023**, *15*, 49. https://doi.org/10.1186/s13195-023-01198-6.
[22] Kraut, R. Aristotle's Ethics. In *The Stanford Encyclopedia of Philosophy*; Zalta, E. N., Nodelman, U., Eds.; Metaphysics Research Lab, Stanford University, 2022.
[23] Reed, P. G.; Haugan, G. Self-Transcendence: A Salutogenic Process for Well-Being. In *Health Promotion in Health Care – Vital Theories and Research*; Haugan, G., Eriksson, M., Eds.; Springer: Cham (CH), 2021.

and longevity in multiple studies. One study reported that greater social integration was linked to lower physiological dysregulation in a dose–response pattern across both early and later life.[24] In contrast, social disconnection markedly increased risk at specific life stages. For instance, during adolescence, social isolation raised inflammation risk to a degree comparable to physical inactivity. At the same time, in older age its impact on hypertension exceeded that of established clinical risk factors such as diabetes.

Furthermore, love and trust have been associated with the hormone oxytocin, which has antioxidant and anti-inflammatory properties, and is capable of regulating one of the major stress axes (the hypothalamic-pituitary-adrenal axis), the parasympathetic nervous system, and other systems associated with chronic disease.[25]

In addition, spirituality and religiosity have been associated with enhanced longevity.[26] In one meta-analysis of 13 prospective cohort studies, seven found that higher religiosity was associated with lower mortality, while the remaining studies yielded mixed results.[27] While social connection may have accounted for some of these associations, most studies found a reduction in all-cause mortality in religious groups even when accounting for mediating factors. Perhaps faith matters.

The other aspects of self-transcendence also likely impact healthspan and longevity. The self-reflective component likely connects to PIL, and time perceptions are strongly related to longevity. For example, subjective age is simply how old a person *feels*, rather than how old they are on the calendar. Research shows that this felt age is a stronger predictor of health and longevity than chronological age, because it reflects everyday motivation, stress levels, social engagement, and health behaviors. In other words, feeling older than your actual age often signals deeper psychological and behavioral strain—making subjective age a more powerful and actionable indicator of aging outcomes.[28]

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[24] Yang, Y. C.; Boen, C.; Gerken, K.; Li, T.; Schorpp, K.; Harris, K. M. Social Relationships and Physiological Determinants of Longevity across the Human Life Span. *Proc. Natl. Acad. Sci.* **2016**, *113* (3), 578–583. https://doi.org/10.1073/pnas.1511085112.

[25] Horn, A. J.; Carter, C. S. Love and Longevity: A Social Dependency Hypothesis. *Compr. Psychoneuroendocrinology* **2021**, *8*, 100088. https://doi.org/10.1016/j.cpnec.2021.100088.

[26] Dominguez, L. J.; Veronese, N.; Barbagallo, M. The Link between Spirituality and Longevity. *Aging Clin. Exp. Res.* **2024**, *36* (1), 32. https://doi.org/10.1007/s40520-023-02684-5.

[27] *Association of religiosity and spirituality with survival among older adults: a systematic review*. http://ouci.dntb.gov.ua/en/works/4YE8xYQ4/ (accessed 2025-12-26).

[28] Zhavoronkov, A.; Kochetov, K.; Diamandis, P.; Mitina, M. PsychoAge and SubjAge: Development of Deep Markers of Psychological and Subjective Age Using Artificial Intelligence. *Aging* **2020**, *12* (23), 23548–23577. https://doi.org/10.18632/aging.202344.

The DMN mediates self-reflection and time integration. In addition, DMN connectivity has been associated with religiosity, spirituality[29] and meditation.[30]

Conclusion

There are many signals that the subjective, difficult-to-measure aspects of human experience play an important role in healthspan and longevity. Processes such as abstraction and imagination, lived experience (qualia), purpose in life (PIL), and self-transcendence are all associated with better health and resilience across the lifespan.

The default mode network (DMN) appears central to this picture, as it underlies these subjective states and is also disrupted in many chronic diseases. As a kind of neural "center of gravity,"[31] the DMN highlights the possibility that healthy living depends not only on measurable biological markers, but also on intangible mental processes that shape what it means to live well.

In an era dominated by devices, metrics, and quantifiable evidence, it is therefore essential that models of disease, health, and intervention continue to include—and rigorously investigate—the subjective and complex dimensions of human experience.

One can imagine, for example, that future aging clocks will incorporate operational representations of subjective variables such as purpose, meaning, and self-perception. In clinical practice, this would shift physicians away from rigid checklists of how to live or what to eat, toward encouraging deeper self-understanding of each individual's uniqueness and building personalized healthspan and longevity plans organized around purpose in life (PIL). Such approaches would also intentionally foster self-transcendence in forms that resonate with the individual rather than imposing a single ideal. I further hypothesize that this growing emphasis on subjectivity will usher in a new kind of self-consciousness in artificial intelligence—one that can approximate these human dimensions but can never fully capture what it truly means to be human.

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[29] Svob, C.; Wang, Z.; Weissman, M. M.; Wickramaratne, P.; Posner, J. Religious and Spiritual Importance Moderate Relation between Default Mode Network Connectivity and Familial Risk for Depression. *Neurosci. Lett.* **2016**, *634*, 94–97. https://doi.org/10.1016/j.neulet.2016.10.009.

[30] Zagkas, D.; Bacopoulou, F.; Vlachakis, D.; Chrousos, G. P.; Darviri, C. How Does Meditation Affect the Default Mode Network: A Systematic Review. *Adv. Exp. Med. Biol.* **2023**, *1425*, 229–245. https://doi.org/10.1007/978-3-031-31986-0_22.

[31] Davey, C. G.; Harrison, B. J. The Brain's Center of Gravity: How the Default Mode Network Helps Us to Understand the Self. *World Psychiatry* **2018**, *17* (3), 278–279. https://doi.org/10.1002/wps.20553.

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